

STUDYING WILLOWS OR MAKING NEW SECTIONS IN THE GENUS *SALIX*

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Recently, Fernald (*RHODORA* 48: 44. 1946) has published two new sections (*Uva-ursi* and *Argyrocarpae*) in the genus *Salix*. The recognized right to publish entails responsibility for adequate information, which seems not to have been met. The equal right of discussion, and of criticism where warranted, also entails responsibilities, herein recognized. Three points should be considered in appraising the discussion.

1. Each of the two new sections contains but a single species. There are several other species in each of the two earlier sections to which these now-segregated species customarily have been assigned. In transferring a species from a plural-species section to become the type of a new 1-species section, there is obligation to show its relationship to all the species of the earlier section and not merely to the type thereof. The description and inclusiveness of a plural-species section always must be broader than those of its type species, just as the description of a plural-species genus always must be broader than that of its type species.

2. There are some 125 species of *Salix* in North America, and several hundreds in the world. Is each of them to become the type of a new section, without comparison with any except the type species of the earlier section (as in the case of *Uva-ursi*) or without any comparison whatever (as in the case of *Argyrocarpae*)? To exclude all other species from a new 1-species section because they differ from its type is no more logical than excluding new species from a genus because they differ from its type species.

3. In announcing conclusions about sections or species of a genus which is widely distributed on five continents, it seems desirable, even necessary, to consider species outside of any particular manual range. For example, the nearest relative of the writer's *S. Setchelliana*, from Alaska and Yukon, is found in the Carpathian Mtns. of southeastern Europe.

NEW SECTION *UVA-URSI* FERNALD

This new section, based on *S. uva-ursi* exclusively, was described by Fernald as differing from *S. herbacea* L., the type

species of section *Herbaceae* Borrer, in having stems strongly ligneous, prostrate but not subterranean; branchlets leafy; leaves firm, not rounded and not conspicuously reticulate, whitened beneath; aments many-flowered; bracts conspicuously hairy; stamens usually 1.

Section *Herbaceae* Borrer (1830) was based exclusively on *S. herbacea*, the only species of the group occurring in Great Britain. It therefore could have been no broader or more inclusive than that species. Several species have been added since.

The idea of the scope of sections in *Salix* has been a gradual evolution, as have most ideas in systematic botany. From 1828 to 1866, Koch, Fries, Hartig, and Wimmer had placed *S. herbacea*, *S. polaris*, *S. retusa*, and *S. reticulata* (all the prostrate creeping willows they had in Europe) in a single section, though under three different section names. But by 1860, Kerner (NiederOst. Weid.) had placed *S. retusa* and *S. herbacea* in section *Retusae*, *S. polaris* in section *Myrtosalix* under *S. myrsinites*, and created a new genus, *Chamitea*, for the *Reticulatae* (*S. reticulata et al*).

Andersson, described by Fernald (p. 29) as "the most accurate student ever to work on *Salix*", monographed the willows of the world (DC. Prodr. **16** (2)) in 1868. In section *Myrtosalix*, he placed most of the present section *Ovalifoliae* and also *S. cascadiensis* (as *S. tenera*, p. 288), *S. phlebophylla* (p. 290), and *S. uva-ursi* (as *S. Cutleri*, p. 292). In section *Retusae*, he placed *S. retusa* (p. 293) with many Asian species, and in *Herbaceae* he placed *S. herbacea*, *S. polaris*, and *S. rotundifolia*, with some Old World species, and including *S. glacialis*, which is merely juvenile *S. ovalifolia* (the type species of section *Ovalifoliae*). The two most closely related species, *S. phlebophylla* and *S. rotundifolia*, are placed in different sections.

Schneider (Bot. Gaz. **67**: 48. 1919) includes in section *Herbaceae* the following North American species: *S. cascadiensis* (NW. U. S. & adj. Can.), *S. Dodgeana* (NW. U. S.), *S. phlebophylla* (NW. N. A.), *S. polaris* (circumpolar), *S. rotundifolia* (NW. N. A.), and *S. uva-ursi* (NE. N. A.). He suggested, however, that *S. uva-ursi* was widely separated by its bicolored leaves and single stamen.

In creating section *Uva-ursi*, Fernald compares the type (and only) species, *S. uva-ursi*, solely with *S. herbacea*, the only other

species of section *Herbaceae* occurring within the Manual range. No mention is made of the others, some of which are much more like *S. uva-ursi* than they are like *S. herbacea*. It seems desirable to take up the description of this 1-species section, point by point.

1. "Stems Strongly Ligneous". The five species commonly placed in section *Herbaceae* with *S. herbacea* and *S. uva-ursi* vary considerably in plant size but all of them have the ligneous prostrate stems, not or only partly subterranean, often "forming extensive superficial and very leafy carpets", as Fernald said of *S. uva-ursi*. *S. polaris* is more nearly like *S. herbacea*. The other four are more like *S. uva-ursi*. Several authors speak of the stems of these others as being partly subterranean. Furthermore, *S. herbacea* is not always a delicate plant with slender stems. Dutilly 6605 (Herb. Ball) from Chesterfield Inlet has stout and strongly ligneous stems to 4 mm. thick, and other specimens have stems anything but delicate.

2. "*Branchlets Leafy*". Both species and section *Uva-ursi* are described as having "leafy branchlets", while *S. herbacea* is said to have short branchlets with only 3–4 leaves. Most species have fewer leaves on short branchlets and more on longer ones. That holds for all those assigned to section *Herbaceae*. Linton, a life-long personal student of willows, says (Mon. Brit. Willows, p. 79. 1913) that the short branchlets of *S. herbacea* have 3–5 leaves. My Iceland specimen, specially collected by Wm. F. Palsson (No. 146) in 1939, has 5 branchlets with 6 leaves each and 2 branchlets with 7 leaves each. *S. polaris* shows about the same numbers. It is more similar in habit to *S. herbacea* while the other four are more similar to *S. uva-ursi*.

3. "Leaves Firm". The leaves of *S. uva-ursi* (*S. Cutleri*) undoubtedly are firm, Andersson (1868) calling the adult leaves extremely rigid. But the leaves of *S. phlebophylla*, *S. rotundifolia*, *S. Dodgeana*, and *S. cascadiensis* also are firm. Of *S. phlebophylla*, Andersson said (1868, p. 290) that the leaves are coriaceous but, more strangely, he called those of *S. polaris* "coriaceo-rigidibus" also. The leaves of *S. phlebophylla* remain attached and skeletonizing for 2 or 3 years. For section *Herbaceae*, Andersson described the leaves as "coriaceo-indurata".

4. "Leaves Not Rounded". They also are not rounded in some of the other species of *Herbaceae*. *S. phlebophylla* has

obovate-spatulate or elliptical-spatulate leaves, *S. Dodgeana* has smaller but similar elliptical-obovate leaves, while those of *S. rotundifolia* are roundish. These three are very closely related. *S. cascadiensis* has linear-oblong or narrowly elliptical leaves. Of the seven related American species, three have leaves more or less roundish and four have not.

5. Leaf Margins. *S. uva-ursi* and *S. herbacea* are alike in having the blades crenulate-serrulate, a fact not mentioned by Fernald. The serrations of *S. herbacea* sometimes are prolonged and inflexed. *S. polaris* has the blades sometimes slightly crenulate-serrulate. The others have entire leaves.

6. "Leaves Not Conspicuously Reticulate". Study of 47 specimens of *S. uva-ursi* (Herb. Ball), 20 from New England and Lower Canada and 27 from Labrador Peninsula, shows that, practically without exception, their leaves are reticulate on one or both surfaces. "Reticulate" is used here as showing prominent tertiary veins connecting the secondary (lateral) veins, and so forming nets. On specimens collected early in the season, reticulation is not well developed but even then conspicuous reticulation will be found on the lower surface of several leaves and on the upper surface of one here and there. Its prominence increases as the season progresses and the leaves become older, many collections showing the lower surface conspicuously reticulate and the upper becoming more so. Collections in late August and September usually show both surfaces prominently reticulate, resembling those of *S. ovalifolia*. Andersson (1868, p. 292) stated that the leaves of *S. uva-ursi* (*S. Cutleri*) had the elevated nerves reticulate beneath, just as he said for both surfaces of *S. herbacea* (p. 298).

All of the species under discussion have the secondary (lateral) veins prominently developed. All of them show a tendency to become reticulate with age, especially *S. phlebophylla*, which is most comparable to *S. uva-ursi* in habit, and in size and shape of leaves, and in progressive reticulation also. The leaves of *S. rotundifolia*, though smaller, show exactly the same range of reticulation, and those of *S. Dodgeana* show it also but less markedly. These three are most closely related to *S. uva-ursi*. Even the long slender leaves of *S. cascadiensis*, with the secondaries closely crowded, show occasional reticulations on one or other side of individual leaves.

7. Leaves "Whitened Beneath". The leaves of *S. uva-ursi* are glaucescent ("whitened") beneath, whereas those of *S. herbacea* and the others species under discussion normally are green beneath. However, *S. cascadiensis*, which extends from Wyoming and Utah to Washington and British Columbia, produces plants with some of the leaves glaucescent beneath throughout its range. No plant with all leaves glaucescent has been noted. Coville (Will. of Alaska) says that the leaves of *S. polaris* are green or somewhat glaucescent beneath, but the writer has not observed such glaucescence.

But Section *Lucidae* has green-leaved species (*S. lucida* and *S. caudata*) and glaucous-leaved species (*S. serissima* and *S. lasiandra*), the first member of each pair being eastern (manual range) and the second western. Section *Cordatae* also has green-leaved species (*S. myrtillifolia*, *S. monochroma* and *S. pseudocordata*) and glaucous-leaved species (*S. cordata* Muhl., *S. Farrae*, *S. ligulifolia*, *S. lutea* and *S. mackenziana*), the first-named species in each group occurring in the manual range. And Fernald himself named a glaucous-leaved variety (*brachypoda*) of green-leaved *S. myrtillifolia*. He also named a widely-distributed glaucous variety (*hypoglauca*) of the narrowly localized green-leaved *S. pedicellaris* Ph. Evidently, glaucousness need not be uniform in sections.

8. Petiole Length and Thickness. The leaves of *S. uva-ursi* were said to be "short-petioled" (not included in section description) while those of *S. herbacea* were described as "slender-petioled". These are not truly contrasting terms. Gray's Manual does not mention the petioles. Those of *S. herbacea* are described in Britton and Brown (Illus. Fl.) and Britton (Man.) as "very slender, 4–8 mm. long" and those of *S. uva-ursi* as 2–4 mm. long.

A study was made on 57 specimens of *S. herbacea* (Herb. Ball), 7 from south of the St. Lawrence and 50 from north of it. In the southern plants the petioles were from 1–4 or occasionally 5 mm. long and mostly stout. On the 50 northern plants the leaves average smaller and the petioles shorter, mostly 1–3 mm., occasionally 4 mm., and only once reaching 5 mm. In width, they varied from 0.3–1 mm., and mostly between 0.5–0.6 mm., which is not "slender" for organs of those lengths. Gardner

176 from Cut-throat Id., Labrador, has leaves to 2.2 cm., and petioles to 3–5 mm. long and 0.8 mm. wide (stout). Gardner 1075 from Hudson Bay has petioles 2–3 mm. long and 0.7 mm. wide. Potter & Brierly 8727 from Eclipse Harbor, Labrador, has petioles 3 mm. long by 1 mm. wide. In European *S. polaris*, closely related to *S. herbacea*, the petioles range from 1–3 or 4 mm. long.

On 20 specimens of *S. uva-ursi* (Herb. Ball) from New England and Lower Canada, the petioles average just a little less in width than those of *S. herbacea*. Of the two, therefore, *S. uva-ursi* really has the “slender” petioles.

9. “Aments Many-Flowered”. The aments of section *Uva-ursi* are described as “many-flowered”, while *S. herbacea* is said to have “2–8-flowered tiny aments”. In Gray’s Manual (1908), the aments of *S. uva-ursi* are described as 2–3 cm. long in fruit, while those of *S. herbacea* are said to be 4–10-flowered, on 2-leaved branchlets. Britton & Brown (Ill. Fl., in 1896) and Rydberg in Britton (Man., in 1901) both describe the pistillate aments of *S. uva-ursi* as 2–5 cm. long in fruit, and the aments of *S. herbacea* as 4–8 mm. long and 4–10-flowered, on 2-leaved branchlets.

Andersson (in DC. Prodr. 16) in 1868, is not definite about ament size on the 6 species included but he does say that those of *S. herbacea* (p. 298) are 3–12-flowered, on usually 2-leaved (subbifolios) branchlets, and that those of *S. polaris* (p. 299) are 3–9-flowered. In 1858, however, he stated (Sal. Bor.-Am.) that the aments of *S. uva-ursi* (*S. Cutleri*) are an inch long and that those of *S. phlebophylla* (p. 73) are minute to $\frac{1}{2}$ inch or 1 inch long. Wimmer (Sal. Europ.), in 1866, not concerned with American *S. uva-ursi*, recorded the aments of *S. herbacea* as 4–12-flowered, *S. polaris* as few-flowered, *S. retusa* as 4–15-flowered, and *S. reticulata* as many-flowered. Linton, a life-time student of British willows, stated (Monog. Brit. Will., p. 79. 1913) that the catkins on *S. herbacea* are $\frac{1}{2}$ – $\frac{3}{4}$ inch long, the pistillate 3–12-flowered and rarely elongating to nearly an inch. This is not exactly “tiny”.

Most of the 57 specimens of *S. herbacea* in Herb. Ball are late-collected and do not have fruits. The mostly depauperate Labrador specimens have at least 8 flowers and perhaps more.

One from Campbell Lake, NWT. (Radford 186) has 10 or more. Steinmetz 1134 from Mt. Katahdin, Me., has aments 1 cm. long and with 10 or more flowers. Merrill from Mt. Katahdin in 1898 has one ament 1.7 cm. long (not tiny), and with 12 or more flowers. It is difficult to count the capsules on mounted specimens without injuring them. European specimens of *S. herbacea* in my herbarium are 8–14 flowered. A vigorous Iceland specimen is 10–16- (or 17)-flowered (double the number allowed by Fernald) and the aments are up to 1.5 cm. long, which scarcely is “tiny”.

10. Two-Leafed Peduncles of *S. Herbacea*. Fernald draws no distinction between *S. uva-ursi* and *S. herbacea* on this point. However, Andersson referred to the peduncles of *S. herbacea* as “subbifolios” and most later writers have called them “2-leaved”. One Hungarian specimen in Herb. Ball shows 3 leaves and the Iceland plant has 3–4 leaves per peduncle.

11. “Bracts Conspicuously Hairy”. The flower scales in new section *Uva-ursi* are described as “conspicuously silky” and those of *S. herbacea* as “nearly glabrous”. Andersson in 1868 said that the bracts of *S. herbacea* were glabrous or gray-pilose and Linton in 1913 calls them glabrous or thinly pubescent. But in 1868, Andersson, “the most accurate student ever to work on *Salix*” (Fernald, p. 29), calls the bracts of *S. uva-ursi* (*S. Cutleri*) obscurely villose; those of *S. polaris* “glabris vel villosulis”; those of *S. phlebophylla* white-pilose or barbate; those of *S. rotundifolia* as sufficiently long-ciliate; and those of *S. cascadiensis* (*S. tenera*) as long-pilose. Do the white-pilose bracts of *S. phlebophylla* and the long-ciliate bracts of *S. rotundifolia* put these two intimately related species in different sections?

12. “Stamen Usually 1”. The staminate ament of section *Uva-ursi* is described as having “stamen usually 1”, and *S. uva-ursi* as having “stamens solitary (rarely 2)”. Schneider says (p. 50) that he has “very rarely found two stamens in one flower”. The uni-staminate condition is found to about the same degree in *S. purpurea*, the European basket willow widely introduced in Colonial America. It also characterizes *S. sitchensis* and *S. Coulteri* (section *Sitchenses*), and occurs occasionally in other diandrous species.

It is a phenomenon of the *Diandrae* only and is caused by more

or less complete fusion of the two filaments. When the "rarely 2" stamens occur, the union has not taken place. But the staminate expression is not as simple as that. All degrees of fusion occur. The two filaments may be entirely separate, as noted, or they may be united for any fraction of their length ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$) or all of it. Sometimes when the filaments are completely united, there still will be two separate anthers. Sometimes these also will be united into one. The partial union of the 2 filaments occurs in numerous species of the *Dian-drae* and usually is described as "filaments sometimes united at base" or "for part of their length".

In Summary. The characters alleged to separate section *Uva-ursi* from *S. herbacea* (type species of section *Herbaceae*) have been reviewed above, in comparison with those of five related North American species usually assigned to section *Herbaceae*. From the data presented, it is clear that either: (1), section *Uva-ursi* must be rejected outright; or (2), some four other American species must be added to it and the description completely rewritten. But first it must be decided whether there is sufficient difference between two groups in these seven species to warrant recognition of two separate subsections or sections. These two groups include *S. herbacea* and *S. polaris*, on the one hand, and *S. uva-ursi*, *S. phlebophylla*, *S. rotundifolia*, *S. Dodgeana*, and *S. cascadiensis*, on the other. That decision, however, will require full study of many related European and Asian species. Such study has not been made.

NEW SECTION ARGYROCARPAE FERNALD

In creating section *Argyrocarpae*, Fernald says merely that the type species, *S. argyrocarpa*, "stands so far apart from other willows that it deserves a place in the system of sections". This is dogmatic assertion, not science. No supporting facts are given, except that Schneider, whom Fernald had just previously denounced (p. 14) as the author of "what has been called this Schneid. treatment" of certain American willows, is here rehabilitated as a "close student of the genus" because he did not assign *S. argyrocarpa* to any existing section.

This new section includes only *S. argyrocarpa* Andersson, and the description reads: "Shrub 0.2–1.7 m. high; leaves shining-

silky (micaceo-sericeis) beneath; pedicels elongated, 2–4 times as long as the two glands; stamens 2.” Actually, instead of being “far apart from other willows”, it is a blood brother to *S. pellita*, also of the Manual range, and closely related to *S. bella*, *S. Drummondiana*, and *S. subcoerulea* of western America. It is not distantly related to four or five other species. Previous treatments are discussed below.

Andersson, in 1867 (Monog. Sal., pp. 106 & 125) and 1868 (in DC. Prodr. **16** (2): 233 & 240), described two sections: 11, *Argenteae* or *Repentes*, and 12, *Virentes* or *Phylicifoliae*, and arranged all of the then-known American species of section *Argenteae* in one or the other of the two. He described each section briefly but only a few really contrasting characters are given. These contrasts are noted below, with a few significant but non-contrasted characters included in parentheses.

Sect. 11, *Argenteae* or *Repentes*. Shrub often low; leaves long, linear-lanceolate, most often silvery-tomentose (sharply nerved above), margin revolute or serrate; aments subsessile; capsules more or less pedicelled, commonly sericeous; style short but distinct.

Under this section, Andersson arranged numerous species belonging to five more or less different groups: 1, *S. sitchensis*, the type species of section *Sitchenses*; 2, *S. argyrocarpa*, the subject of our discussion, of which more later; 3, *S. petiolaris*, and thereunder, as subspecies or varieties, *S. subsericea*, *S. gracilis*, and *S. sericea*, at present recognized as species or varieties; 4, *S. humilis* and *S. tristis*, commonly assigned to section *Capreae* (along with *S. discolor*, *S. Scouleriana*, and the European *S. caprea* and *S. cinerea*, grown in America as florists’ willows); and 5, the little European *S. repens*, along with other Old World species.

Sect. 12, *Virentes* or *Phylicifoliae*. Shrub often tall; leaves broad, subobovate or ovate-lanceolate, commonly glabrous, (glaucous below), remotely inflexed-serrulate, nerves subparallel; aments subsessile; (bracts black-tipped, pilose), capsules pedicellate, (conic-rostrate); commonly silky (called “glabrous or tomentose” in 1867. CRB.); style rostrate.

Four groups of American willows were assigned by Andersson to this section: 1, *S. phylicifolia* (*S. planifolia* Ph.), *S. fulcrata*

and *S. phylicoides* (both *S. pulchra*), these and other American and Old World species actually comprising section *Phylicifoliae*; 2, *S. Drummondiana* and *S. chlorophylla* Anders. (the latter including present *S. pellita* Anders. and *S. subcoerulea* Piper), all belonging to section *Argenteae* and discussed more fully later; 3, "*S. macrocarpa* Nutt.", which, whatever it was, obviously was not Nuttall's plant (*S. Geyeriana* Anders.); and 4, *S. humillima* (*S. arbusculoides* Anders.), also discussed later on. He included also *S. arbuscula* L., and many other Old World species.

Under these two section names, Andersson thus assembled a miscellaneous mass of species actually belonging to several widely different sections of the genus. He should not be too severely blamed for this confusion. He was attempting the impossible task of writing up the willows of the world (for DC. Prodr.) in a limited time, and with inadequate material probably not all before him at one time.

Much inaccurate description results from these two groupings of unrelated species. For example, his *Argenteae* are assigned long, linear-lanceolate leaves but those of *S. sitchensis*, *S. humilis*, and *S. tristis* are distinctly oblanceolate and narrowed at the base, and in the first two species often broadly oblanceolate and cuneate. The leaves also are described as strongly nerved above but those of *S. argyrocarpa* are just the opposite. In section *Phylicifoliae*, the leaves are described as broad, subobovate or ovate-lanceolate, and also are said to be "commonly glabrous" (the real *Phylicifoliae*). But those of *S. pellita* and *S. arbusculoides* are narrowly lanceolate and those of both *S. pellita* and *S. Drummondiana* are among the most densely hairy of American willows. The "conic-rostrate capsules" really occur on *S. humilis* and *S. tristis*, listed in section *Argenteae* but not belonging to either section.

Eight (or 9) of the ten (or 11) North American species commonly assigned now to section *Argenteae* are scattered at intervals, by Andersson, through both his *Argenteae* and *Phylicifoliae*. Only four (or 5), *S. argyrocarpa*, *S. petiolaris* (and *S. gracilis*), *S. sericea*, and *S. subsericea*, were placed in *Argenteae*. Four others, *S. arbusculoides*, *S. Drummondiana*, and *S. chlorophylla* (covering both *S. pellita* and *S. subcoerulea*) were placed in *Phylicifoliae*. These 8 (or 9) species, with two others not known

to Andersson (*S. bella* Piper and *S. coactilis* Fernald), may be divided into two natural groups. Some may regard these groups as representing subsections and some as representing sections. In either case, the species of each group belong together.

The first group is characterized by leaves with margins revolute and either entire or sparingly undulate-crenulate, the lower surface mostly densely velutinous or silvery-tomentose, the extra-numerous secondary veins impressed in the upper surface, prominently elevated beneath, and diverging from the midrib at relatively broad angles, like the ribs of a vertebrate. Here belong *S. argyrocarpa*, and *S. pellita* of the Manual range, and *S. bella*, *S. Drummondiana*, and *S. subcoerulea* of the Rockies and/or westward. Of these, only *S. argyrocarpa* is placed by Andersson in *Argenteae*, where it belonged.

The second group is characterized by leaves serrate or serrulate on the non-revolute margins, the lower surface densely to thinly covered with short silvery hairs or somewhat glabrate, the secondary veins of normal number and elevated on both surfaces, and diverging from the midrib at the usual sharper angles. This group includes *S. arbusculoides* (far Northwest) and *S. coactilis* Fern. (unknown to Andersson), *S. petiolaris*, *S. sericea*, and *S. subsericea* (all Manual range). Only *S. arbusculoides* was placed in *Phylicifoliae* by Andersson.

Schneider, 50 years after Andersson, and with much more copious material, did almost as illogical a job (Jour. Arnold Arb.). He follows Andersson in dividing these related species between two sections. In section *Griseae* (*Argenteae*), he placed (2: 13–25. 1920) *S. sericea*, *S. coactilis*, and *S. petiolaris*, but omits *S. argyrocarpa* from both sections. He also adds, as did Andersson, *S. humilis* and *S. tristis*, both belonging to section *Capreae*. In section *Phylicifoliae* (1: 67–91. 1919), with the several species really belonging thereto, he placed *S. bella*, *S. Drummondiana*, *S. pellita*, and *S. subcoerulea*, but omitted *S. arbusculoides* from both sections.

Still later (2: 84–89. 1920), he treats both *S. arbusculoides* and *S. argyrocarpa* at great length but is unable to assign them to any existing section. Like Fernald, he gives no reason why he could not place each with its respective group, even if he could not unite the two groups. Like Andersson, Schneider was attempt-

ing the impossible task of a monograph of unfamiliar American willows in limited time and under conditions of physical and mental stress (he was interned, on meager pay, with an otherwise unsupported family in Germany).

There is nothing in Andersson's descriptions of his *S. argyrocarpa* and *S. pellita* which indicates other than closely related species. Andersson compared them himself and rejected close relationship because *S. argyrocarpa* had pedunculate aments and pedicelled capsules whereas *S. pellita* had sessile aments and short-pedicelled capsules. Yet Andersson, in 1868, reduced *S. sericea* to a variety of *S. petiolaris*, although the latter had leafy-peduncled aments and long-pedicelled capsules while *S. sericea* had almost sessile aments and short-pedicelled capsules! Why should the same two characters which permitted one pair of distinct species to be arranged as a species and its variety prevent another pair, much more alike vegetally, from belonging to the same section? Such decisions are sheer nonsense, and it is not clear why Schneider and Fernald chose to follow them.

Both *S. argyrocarpa* and *S. pellita* have narrow leaves with revolute margins, the nerves impressed above and prominent below, the numerous secondaries diverging from the midrib at broad angles, and the blades covered densely with long silvery hairs at first but often becoming quickly and unevenly glabrate to glabrous. These facts should have brought recognition of their very close relationship long ago. On three sheets of unnumbered specimens of *S. pellita*, collected by Fernald at Ft. Fairfield, Me., on June 5, 1901 (Herb. Ball), different portions could be described as varieties based on degrees of pubescence or its absence. The same variation is seen commonly on *S. argyrocarpa*.

In Conclusion

1. The whole purpose of botany, including taxonomy (but not synonymy) is to enable more people to know more about more plants. That purpose is not served by dogmatic assertions without supporting facts. Only useless, confusing, and expensive synonymy is increased thereby.

2. If more living plants and more herbarium specimens were studied more thoroughly, there would much more knowledge and fewer names.

3. If keys were constructed primarily on vegetal characters, representing the major portion of the organism and present throughout most or all of the year, instead of floral characters (soon gone with the wind), willows would be much better known.

EXTENSION SERVICE,
United States Department of Agriculture

UNVERIFIED BIBLIOGRAPHY OF *SCIRPUS*.—Thinking to add to the *Manual* treatment the names of sections under *Scirpus*, I automatically and very naïvely turned to the enumeration of sections in Beetle's *Studies in the Genus Scirpus VII, Conspectus of Sections represented in the Americas*, in *Am. Journ. Bot.* xxxi. 261–265 (1944). I should have known what to expect, after having been obliged to analyze the work of that ambitious author on morphological characters and elementary geography and other details¹; but I imagined that, after pretty severe criticisms of his wholesale lack of precision, his work would have become more accurate. Most unfortunately, however, I was in for further disillusionment; and, since too many students, uncritically accepting what they see in print, especially when it has passed the Editorial Committee of the *American Journal of Botany*, are likely to suppose (as I did) this *Conspectus* of the sections of *Scirpus* to be authoritative, it becomes an unwelcome duty to designate some of the most misleading points. This I do as briefly as is consistent with clarity, Beetle's sectional bibliography repeated in smaller type, this followed in 9-point by statement of a few mere facts.

(1) Section OXYCARYUM Nees, *Mart. Fl. Bras.* 2: I. 90. 1847
based on *Scirpus cubensis* Poepp. & Kunth.

Nees in Martius, *Fl. Bras.* ii¹. (1842—not 1847) defined his NEW GENUS (not section) *Oxycaryum* with a single species, *O. Schomburgkianum*, named for the famous collector, the type from British Guiana.

(2) Section MONOCEPHALES Clarke, *Kew Bull. Add. Ser.* 8. 111–113. 1908.

C. B. Clarke (not one of the earlier Clarkes) in vol. viii of the *Kew Bull. Add. Ser.* enumerated all the 10 sections of *Scirpus* which he recognized in the entire world. Two to five sections were defined, with typical

¹ See RHODORA, xliv. 479–484 (1942) and xlv. 279–296, especially pp. 279, 280, 284, 290 and 291 (1943).